

# A Space and Time Surface Radiation Climatology of the ARM SGP Site

Daniel Hartsock, Claude Duchon, Peter Lamb  
 Cooperative Institute for Mesoscale Meteorological Studies  
 University of Oklahoma

## Monthly Radiation Summaries

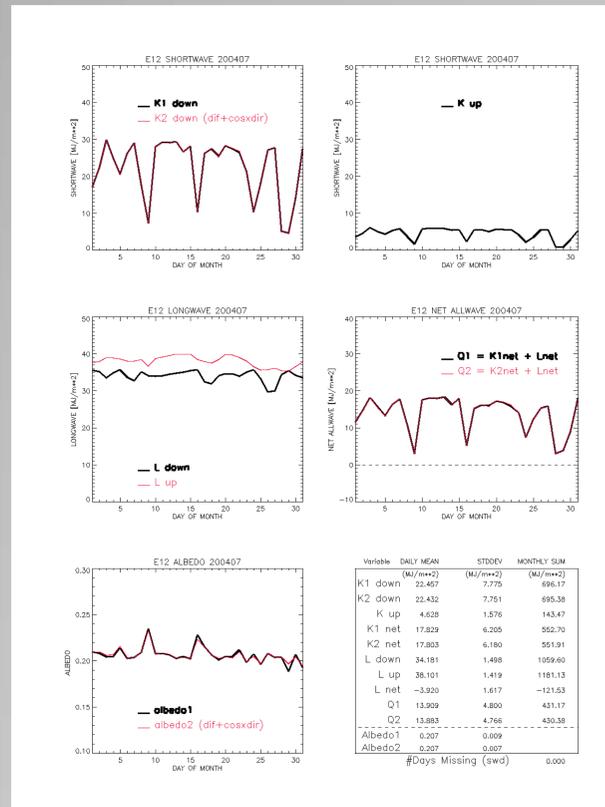


Figure 1. Monthly plots of surface radiation variables taken from the SIRS instrument at Pawhuska (EF12). Albedo is calculated from Kup/Kdn. A summary table includes daily means and monthly sums.

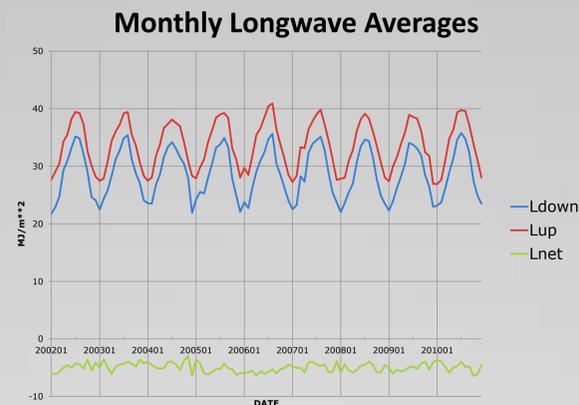
## Summary

We are in the process of developing the surface radiation budget for the SGP ACRF using Solar and Infrared Radiation Stations (SIRS) radiometers.

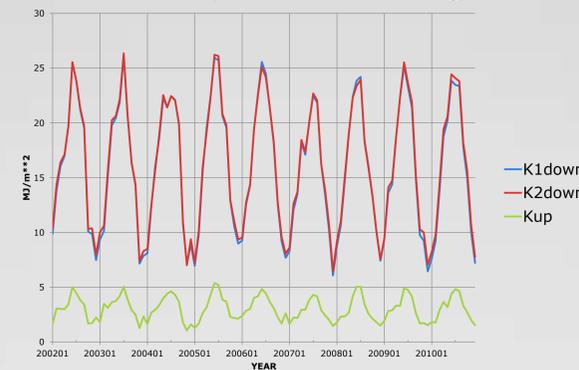
EF12 Pawhuska is used as a test-bed site because of its spatially homogeneous surface properties. Future work includes similar calculations at 6 EF sites.

Quality Checks (QC) are used to identify missing, questionable, and bad data. Practical application of these flags is limited.

## Time Series of Radiation Averages



### Monthly Shortwave Averages



### Monthly Albedo Averages

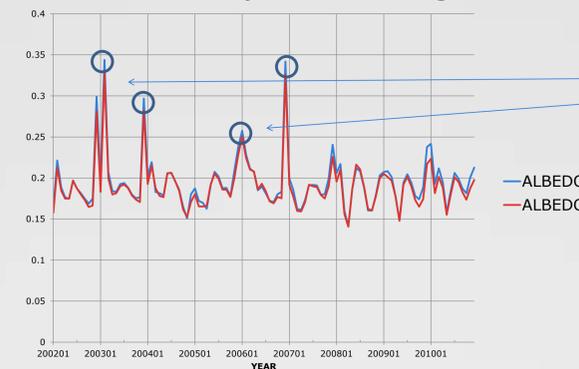


Figure 2. Monthly averages of shortwave (K) and longwave (L) radiation plotted for 9 years of SIRS data at Pawhuska (EF12). Peaks of albedo indicate large snow events.

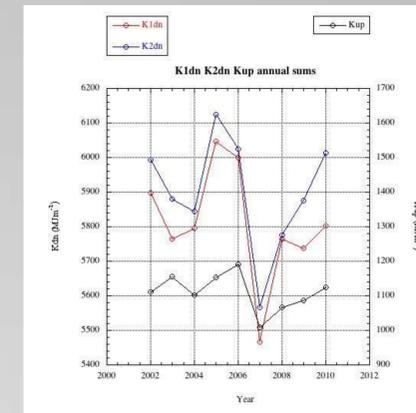


Figure 3 (above) Annual sums of Kdn and Kup.

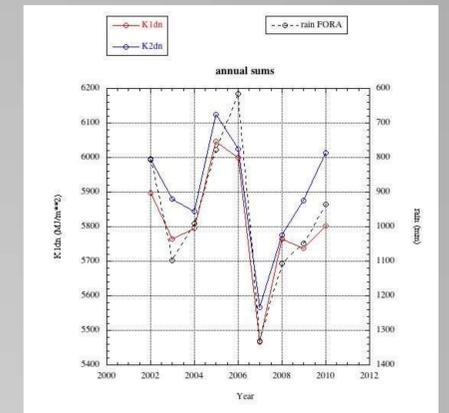


Figure 4 (above right) Annual sums of Kdn with annual rainfall from Foraker Mesonet site. Their close relation is evident.

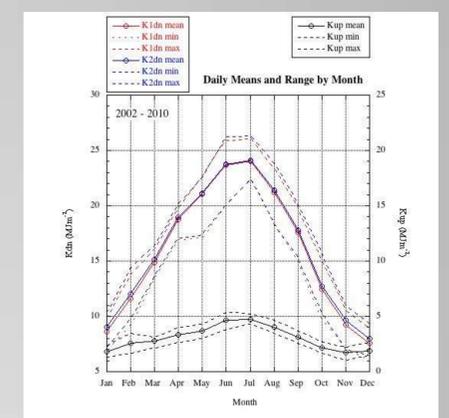


Figure 5 (right) Daily means and range of Kdn and Kup by month.

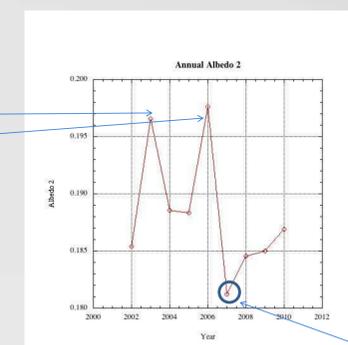


Figure 6. Annual albedo (very wet 2007) and mean monthly albedo and range for period 2002-2010.



ARM

CLIMATE RESEARCH FACILITY

